

Abstract

The invention relates to a polarization-controlled encoding method, encoder and quantum key distribution system, which is characterized in that polarization maintaining light path or 90 degree rotation Faraday mirror are used inside the encoder to keep the polarization of the output pulses same, and that in the quantum key distribution system employing the polarization-controlled encoder the pulse emitted from transmitter is unidirectional-transmitted to receiver and then quantum key distribution is implemented using interference in the pulses according to the quantum key distribution protocol. The quantum key distribution system using the polarization-controlled encoder of the invention has the ability of avoiding the wiretapping to transmitter, receiver and quantum channel. Detection units each of which separates reversed photon from other photons are added at the out port of the transmitter and the in port of receiver, respectively, so that Trojan horse is prevented from entering and photons with phase modulated information are prevented from leaving the safe area in receiver. Unconditionally safe key distribution can be accomplished by using the quantum key distribution system of the invention.